REMARKS

1. INTRODUCTION

Applicants thank the Examiner for the indication of allowable subject matter in claims 11-15. Claims 1 and 5 have been amended as discussed below; claims 4, 16, 22 and 23 have been cancelled; claims 19-21 and 24-27 are withdrawn; and new claims 28-32 have been added. Accordingly, claims 1-3, 5-15, 17, 18 and 28-32 are presently pending in this application. Applicants respectfully request reconsideration of the application in view of the foregoing amendments and the following arguments

2. AMENDMENT TO THE CLAIMS

Amended claim 1 incorporates the subject matter of cancelled claim 4. Claim 5 has been amended in consequence of the amendment to claim 1. New claims 28-32 correspond to original claims 11-15, respectively. Specifically, new claim 28 corresponds to original claim 11 rewritten in independent form, and new claims 29-32 correspond to original claims 12-15. Accordingly, Applicants submit that these amendments do not add any new matter.

3. RESPONSE TO THE DRAWING OBJECTIONS UNDER 37 CFR 1.83(A)

The Examiner's objection to the drawings has been rendered moot by the cancellation of claims 16, 22 and 23. Applicants request that the rejection be withdrawn.

4. RESPONSE TO THE CLAIM REJECTIONS – 35 U.S.C. § 103

A. Claims 1-10 and 27

Original claims 1-10 and 27 stand rejected under 37 USC 103(a) as being unpatentable over U.S. Patent No. 4,096,616 (Coffinberry) in view of U.S. Patent No. 3,323,586 (Burne et al.).

"Patent examiners carry the responsibility of making sure that the standard of patentability enunciated by the Supreme Court and by the Congress is applied in each and every case." MPEP § 2141 (emphasis in original).

> To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations.

MPEP § 2143.

Applicants respectfully submit that the rejection of claim 1 under 35 U.S.C. § 103(a) is improper because the combination of the references cited fail to teach or suggest all of the limitations set forth in the claim.

Independent claim 1 as amended recites a heat exchanger comprising inner and outer concentric tubes having at least one circumferential fluid flow passageway formed along the outer surface of the outer tube. According to claim 1, a corrugated strip fin is arranged in each of the at least one circumferential fluid flow passageways. Claim 1 has been amended to recite that "the corrugated strip fins are arranged in the circumferential fluid flow passageways in a low pressure drop orientation with rows of corrugations in the corrugated strip fins extending axially through the circumferential flow passageways and with apertures through the corrugations extending circumferentially". The arrangement of the corrugated strip fins in the circumferential fluid flow passageways can be explained by reference to Figure 3, showing a longitudinal cross section of a preferred heat exchanger. In this particular embodiment, the corrugated strip fins

(92, 94, 96 and 98) are arranged in two layers. Each of the corrugated strip fins comprises a plurality of corrugations 100 arranged in rows 102 (see Figure 5), the rows 102 extending along the longitudinal axis of the heat exchanger. In this orientation, the apertures 110 defined by the corrugations open in the circumferential direction (i.e. transverse to the longitudinal axis). This is referred to as a "low pressure drop" orientation since it results in a lower pressure drop than if the strip fins were arranged with apertures through the corrugations extending longitudinally.

Coffinberry teaches a heat exchanger comprised of three concentric tubes separated by radially extending spacers to form two annular flow passageways. Corrugated fins 34, 36 are received in the annular flow channels 26, 28 with the apertures defined by the corrugations opening in the longitudinal direction of the tubes. Fluid will flow through the annular flow channels along the longitudinal access. There is no circumferential fluid flow channel in the Coffinberry heat exchanger.

Burne et al. discloses a concentric tube heat exchanger having an annular fluid flow passageway defined between the tubes. According to column 1, lines 41-52, the flow of a heat exchange medium is directed in a peripheral path through the annulus formed by the concentric tubes. This is achieved by providing a body of pervious material in the space between the tubes and by providing channels in the pervious material to serve as inlet and outlet means and to permit uniform distribution of the medium through the pervious material. Burne et al. does not teach or suggest the use of a corrugated strip fin arranged in the low pressure drop orientation and, in fact, teaches that it is necessary to use a pervious material instead of fins or corrugations (column 1, lines 16-23).

Therefore, Coffinberry and Burne et al., either considered on their own or in combination with one another, fail to teach a heat exchanger "wherein the corrugated strip fins are arranged in the circumferential fluid flow passageways in a low pressure drop orientation with rows of corrugations in the corrugated strip fins extending axially through the circumferential flow passageways and with apertures through the corrugations extending circumferentially", as recited by amended claim 1.

For at least this reason, amended independent claim 1 and dependent claims 2-10 are allowable over Coffinberry and Burne.

B. Claims 17 and 18

Original claims 17 and 18 stand rejected under 35 USC 103(a) as being unpatentable over Coffinberry and Burne as applied to claim 1, and further in view of U.S. Patent No. 3,468,371 (Menze).

The Menze patent describes a heat exchanger which comprises three concentric tubular members, the middle member having a spiral corrugation which provides walls defining two separate passageways between the inner tube and the outer tube. Menze does not teach or suggest a heat exchanger having at least one circumferential fluid flow passageway being formed along the outer surface of the outer tube, nor does Menze teach or suggest corrugated strip fins arranged in the circumferential fluid flow passageways in a low pressure drop orientation with rows of corrugations in the corrugated strip fins extending axially through the circumferential flow passageways and with apertures through the corrugations extending circumferentially, as in amended claim 1.

For at least the reasons discussed above with reference to amended claim 1, dependent claims 17 and 18 are likewise allowable over Coffinberry and Burne as applied to claim 1, and further in view of Menze.

5. CONCLUSION

A genuine effort to resolve all issues has been made. For the above stated reasons, all of the claims presently pending in this application are believed to be allowable. Accordingly, such action is respectfully requested.

Respectfully submitted,

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